

Risk of Post-Percutaneous Coronary Intervention Adverse Cardiac Events: What does the Autonomic Nervous Systems have to do with it?

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Background: Post percutaneous intervention (PCI) outcomes have improved in the last 10 years due to advancements in equipment, techniques and follow-up. However, whether there is a reduction in fatal and nonfatal MI following PCI is still under discussion. ST-segment resolution (STR) is a current measure to assess PCI outcome but results are variable. Heart rate variability (HRV) has been shown to be an indicator of CAD and risk of nonfatal or fatal MI. The current study investigated the changes in HRV following elective PCI. **Methods:** Patients were selected at the Mediclinic Middle East Cardiology Department. Pre-PCI and post-PCI (up to 4 hours) HRV was determined from 5-minute heart rate recordings and analyzed using Kubios software. Statistical analysis was by Mann-Whitney test and p value set at 0.05. **Results:** The Parasympathetic Index decreased from -6.142 ± 0.06 to -6.175 ± 0.04 ($p=0.046$), which is 3 standard deviations below the normal range. In terms of cardiac function and ANS modulation, rMSSD decreased from 0.507 ± 0.23 to 0.354 ± 0.13 ($p=0.026$). Similarly, SD1 (0.542 ± 0.33 to 0.515 ± 0.37 ; $p=0.024$) and DFA α 1 (0.625 ± 0.28 to 0.55 ± 0.33 ; $p=0.009$) decreased. TINN and SD2 also decreased post-PCI. TINN, which is a geometric index and robust against noise and ectopics, decreased from 28.07 ± 9.3 to 18.09 ± 6.8 ($p=0.003$). SD2 decreased from 4.73 ± 1.82 to 3.18 ± 1.06 ($p=0.007$). As results were not normally distributed with investigated for a bimodal distribution. The Pareto chart visualization confirms a bimodal distribution for post-PCI patients. Patients could be divided into those with increased stress in the majority of patients, with the remaining patients showing improvement in HRV features. **Conclusion:** Our results indicate that PCI increases physiological stress but that a subgroup of patients may show an improvement in HRV features and concomitant post-PCI outcomes following elective PCI. This suggests that patients with decreased HRV and increased cardiac stress should be closely monitored.

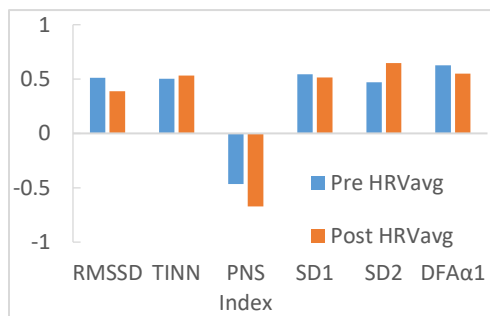


Figure 1. Normalized HRV results



Figure 2. Pareto chart for Post PCI HRV distribution